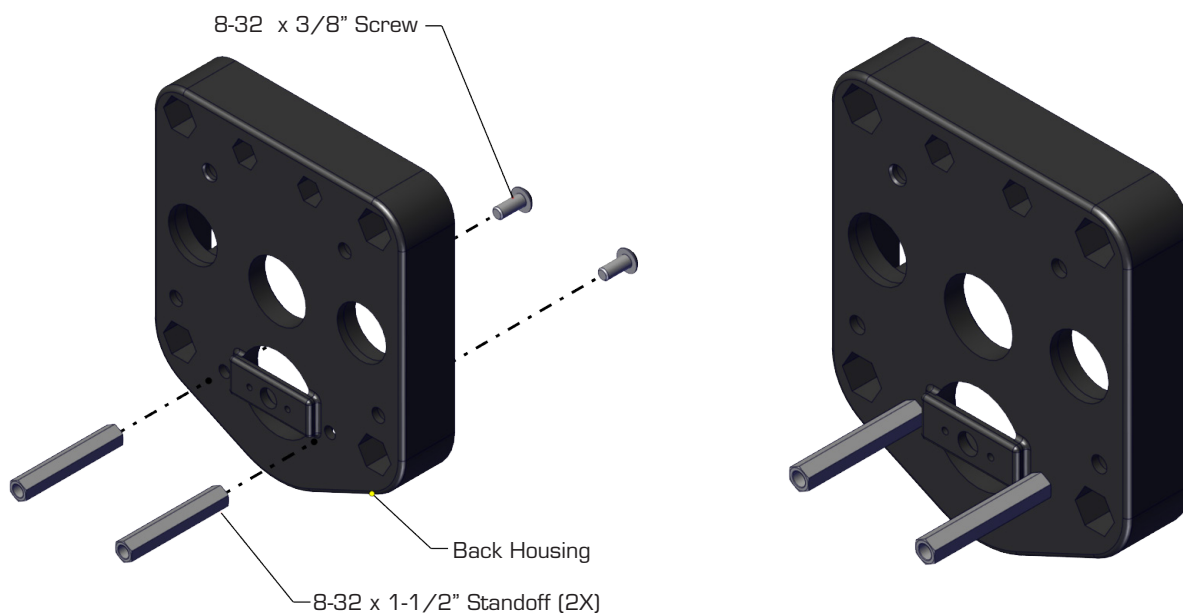
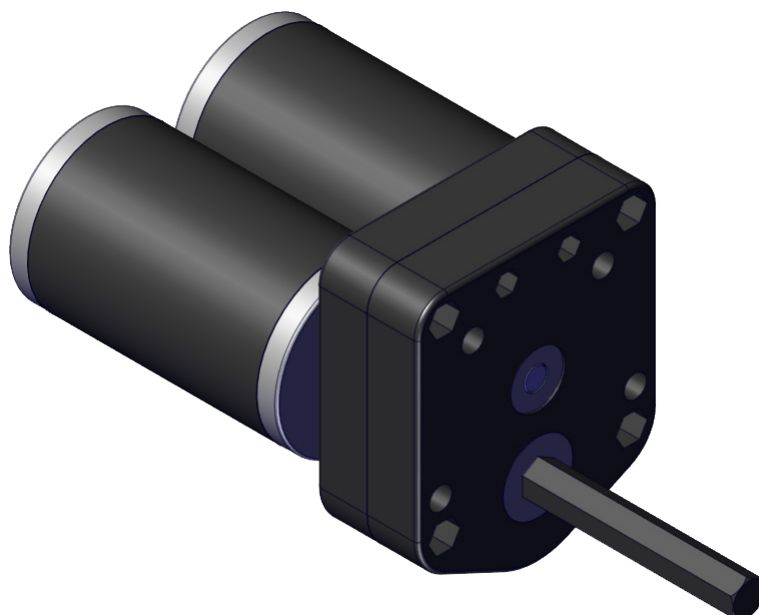
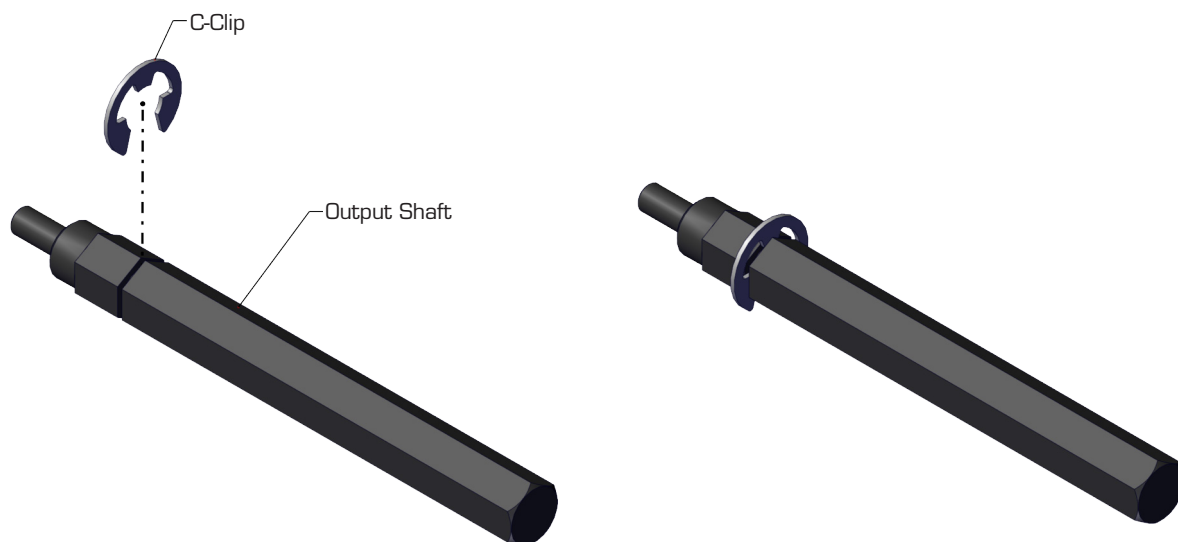


Single Speed, Double Reduction Assembly Instructions

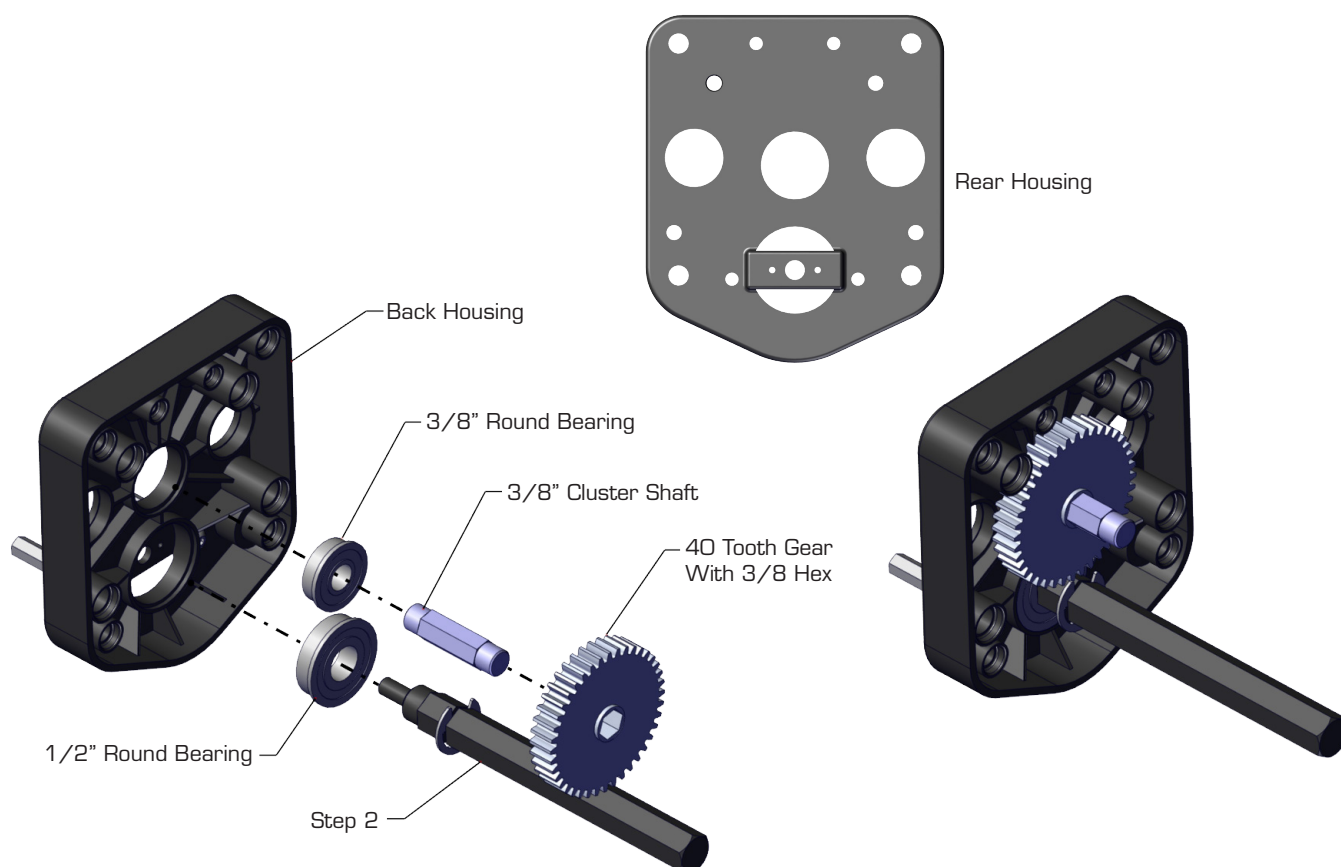


Step 1:

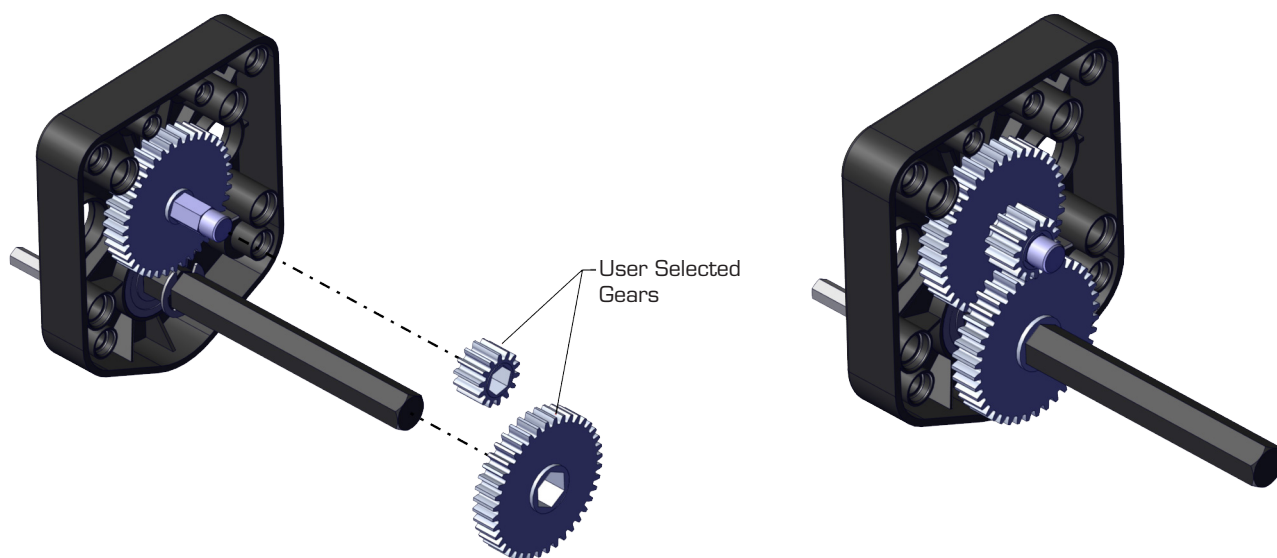
If using a Grayhill Series 63R Encoder (not included), use (2X) 8-32 x 3/8" screws to mount (2X) 8-32 x 1-1/2" standoffs as shown.

**Step 2:**

Clip the C-Clip into the groove on the output shaft.

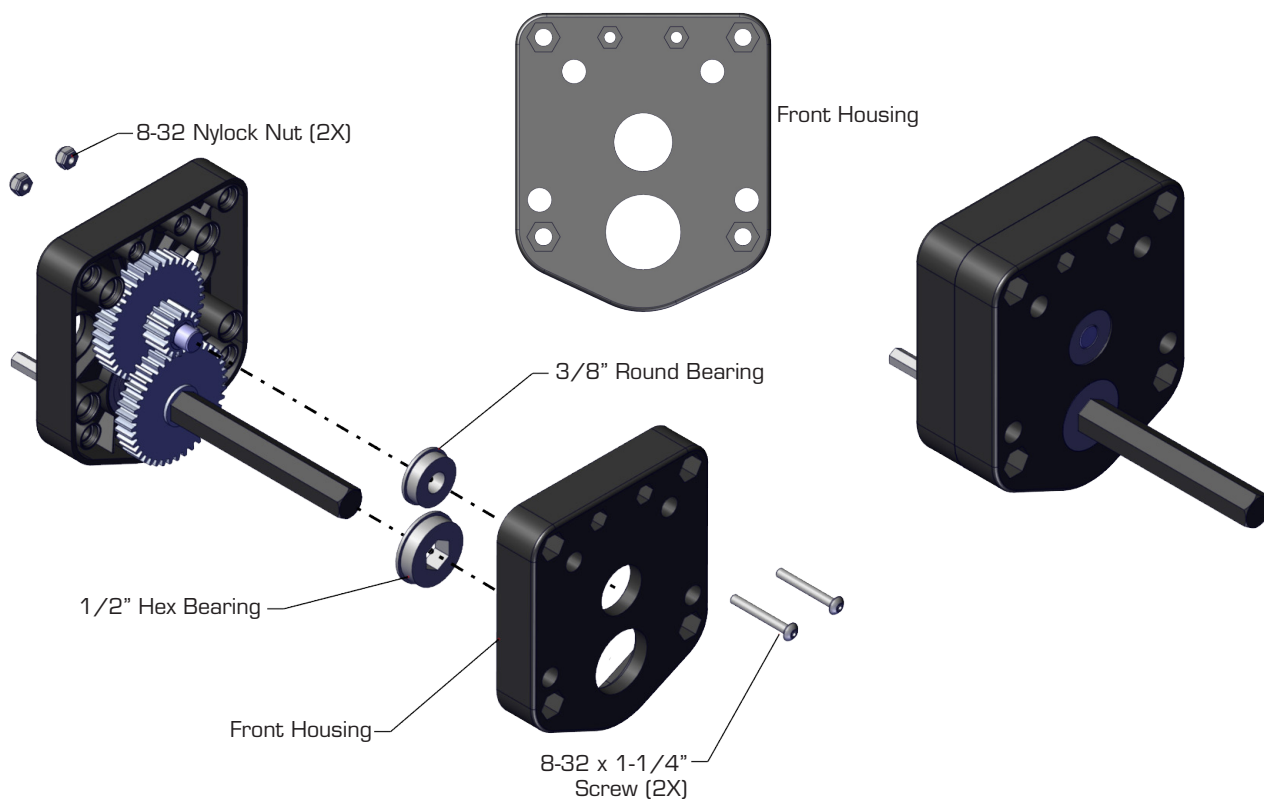
**Step 3:**

Insert 3/8\" and 1/2\" round bearings into the back housing. Install cluster shaft 40 tooth gear and output shaft as shown.



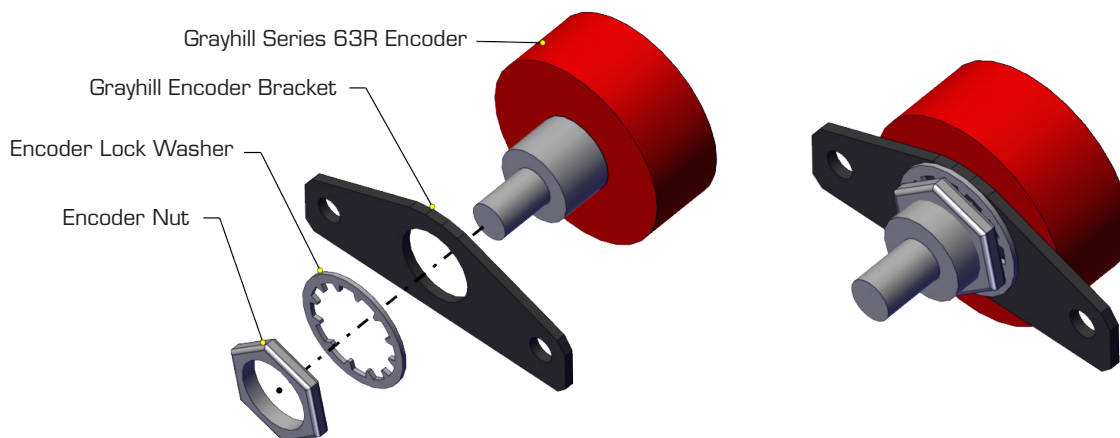
Step 4:

There are 3 recommended combinations of gears for the second stage, 14:40, 20:34, or 24:30. Gear changes are available at vexrobotics.com. Slide the two selected gears onto the appropriate shafts. **At this point, a liberal application of white lithium grease is required on all gears.**



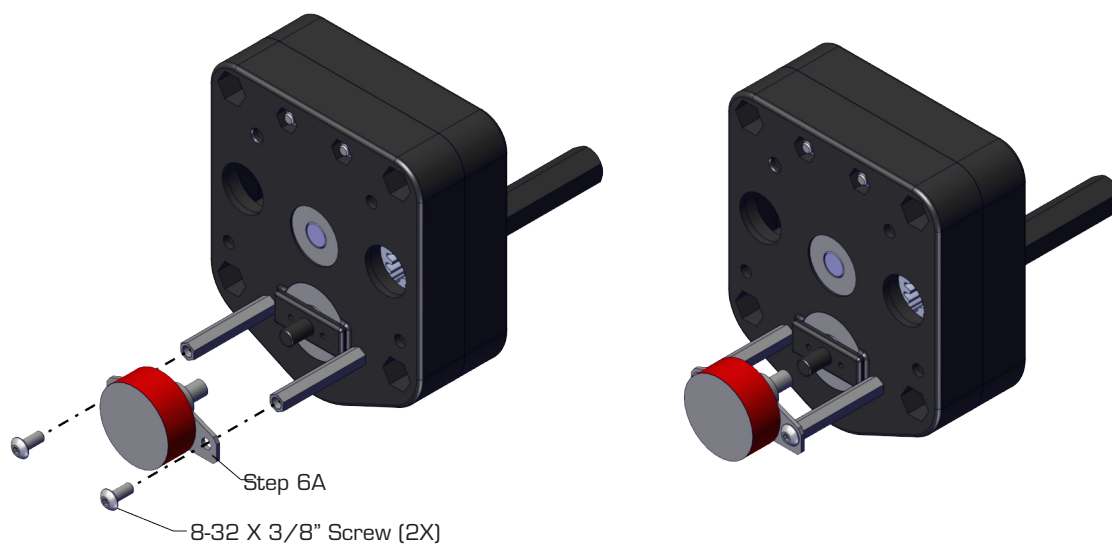
Step 5:

Insert 3/8" round and 1/2" hex bearings into the front housing and mate the two housings. Use (2X) 8-32 x 1-1/4" screws and (2X) Nylock nuts to hold the assembly together as shown.



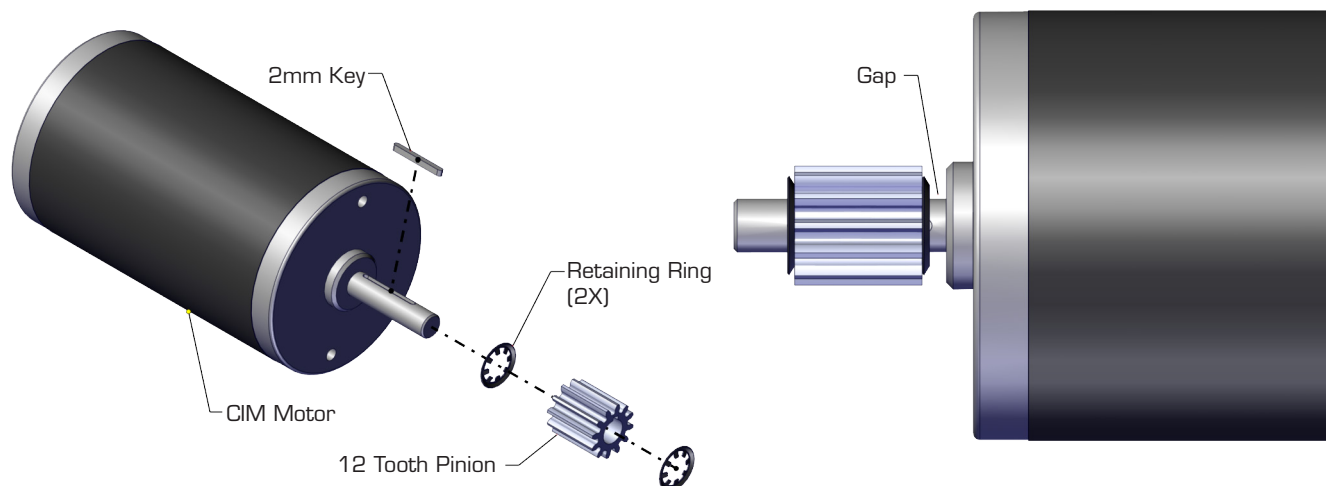
Step 6A:

If using a Grayhill Series 63R encoder, remove the nut and lock washer that come installed on the encoder. Re-install the nut and lock washer with the Grayhill encoder bracket as shown above.

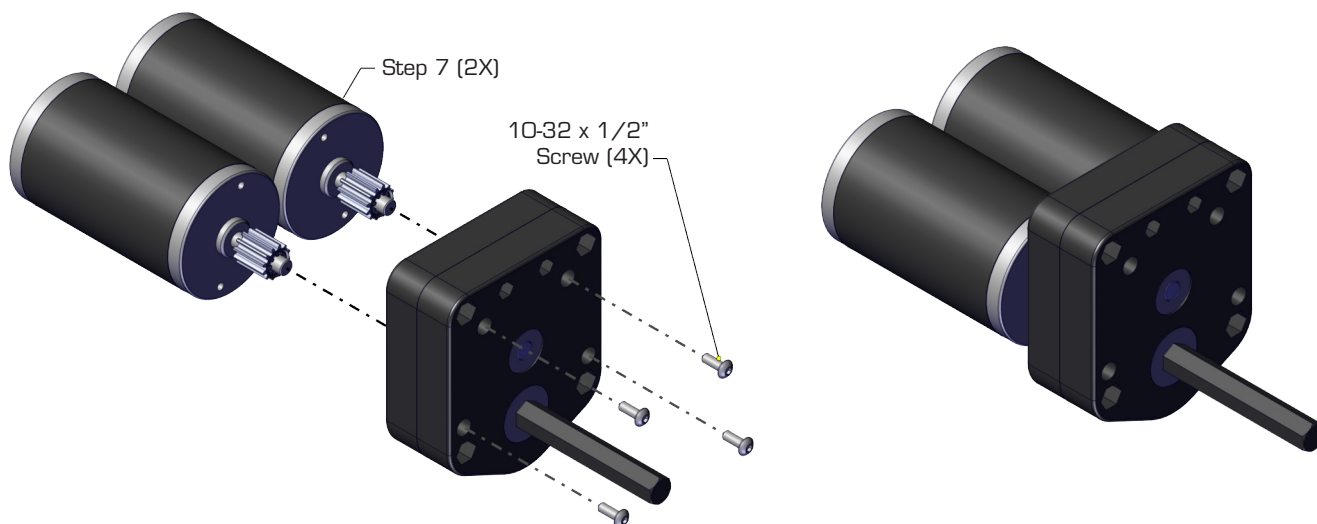


Step 6B:

Use [2X] 8-32 x 3/8" screws to mount the encoder assembly from Step 6A. A coupler for the encoder is NOT provided. A 1/4"-1/4" shaft coupler will need to be provided by the user (McMaster part number 61005K311 or 6208K441).

**Step 7:**

Use a socket to press a retainer ring onto the shaft of a CIM motor. Push the ring to the back of the keyway, but DO NOT allow it to contact the housing of the CIM motor. The "teeth" of the retaining ring should point away from the motor. Insert a 2mm key into the keyway of the CIM motor and slide the 12 tooth pinion gear on. Retain the pinion gear with a second retaining ring as shown. Repeat for a total of (2X) motors.

**Step 8:**

Use (4X) 10-32 x 1/2" screws to mount (2X) motor assemblies from Step 7.